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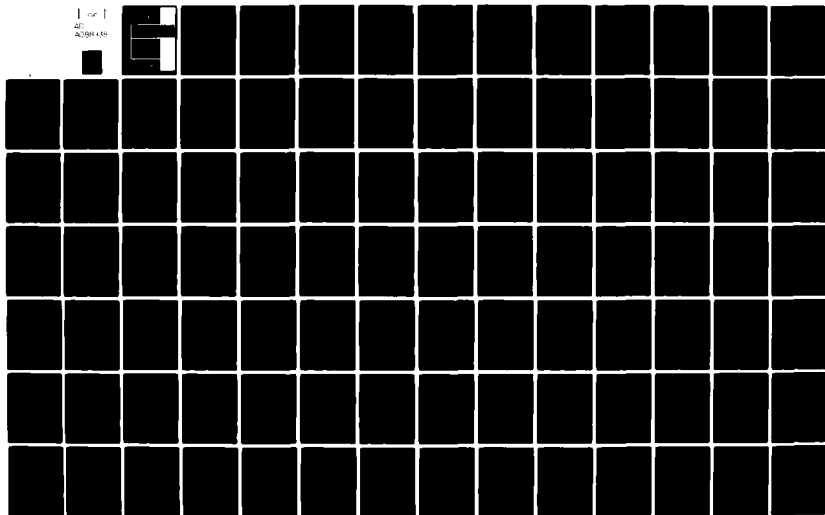
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VOLUME 3 - LITERATURE SURVEY

by

George S. Pick
Richard M. Hartley

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AVIATION AND SURFACE EFFECTS DEPARTMENT

DTNSRDC/ASED-80/13

June 1980

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ABSTRACT

The results of the afterbody drag study are presented in four volumes -- Volume 1: Drag of Conical and Circular Arc Afterbodies; Volume 2: Jet Interface Effects on Subsonic Boattail Drag; Volume 3: Literature Survey and Volume 4: Data and Analysis.

Volume 3 includes summaries of 119 reports, a bibliography of 608 reports, and a discussion of theoretical approaches to afterbody drag.

ADMINISTRATIVE INFORMATION

The survey was conducted by the Aviation and Surface Effects Department of the David W. Taylor Naval Ship Research and Development Center with clerical assistance by Payne, Incorporated under ONR Contract N0014-75-C0926. The afterbody drag project was supported by the Naval Air Systems Command and the Naval Weapons Center under Program Elements 61153N, 63361N, and 62332N; Task Areas WR 023 02 003, W15X20000, and F32.322.203; and Work Units 1660-234 and 1660-235.

The references and bibliography are in the format of Payne, Incorporated.

INTRODUCTION

A literature survey was conducted as part of the afterbody drag evaluation project. The results of the survey are presented in four sections: (1) discussion of studies by various authors; (2) list of 119 reports considered applicable to the evaluation; (3) summary of the 119 reports in tabular form (~~Table 1~~); and (4) bibliography of open literature (608 reports and papers).

DISCUSSION

The literature survey disclosed that the vast majority of the open literature reports are very specialized or address a narrow subject matter. These reports are not suitable for establishing a basis from which the effects of the various geometrical, physical, and environmental parameters of afterbody drag can be systematically investigated. Only a small number of the reports are suitable for this purpose. These reports address conical afterbodies in the subsonic and transonic speed ranges.

Studies, evaluations, or research generally can be classified as experimental, empirical, or theoretical.

EXPERIMENTAL

In the subsonic and transonic speed ranges, only a small number of reports of the experimental type are suitable for establishing the foundation of an afterbody drag evaluation. References 1 through 5* are in this category and are based on the systematic testing of basic configurations over a wide range of geometrical parameters and Mach numbers.

EMPIRICAL

References 6 through 11 present various approaches to the problem of predicting boattail drag.

McDonald and Hughes⁶ propose a method for the prediction of boattail drag and base drag of curved, conical, and cylindrical afterbodies and the effect of jet flow on the drag characteristics of the three types of afterbodies. The method, however, does not consider variation of the

*A complete listing of references is given on page 5.

drag characteristics with Mach number, and its applicability is therefore limited. The method does introduce a direction of approach which can be applied to further investigations.

Bergman⁷⁻⁸ proposes several approaches for the prediction of after-body drag. One approach (Reference 7) presents qualitative and quantitative analysis of the effect of nozzle geometry and some physical parameters on the boattail drag. However, the effect of Mach number and base drag is not considered. A subsequent method (Reference 8) also does not consider base drag and is suggested only for Mach numbers less than 0.9.

The method of Swavelly and Soileau⁹ uses a parameter referred to as Integral Mean Slope, which is obtained by integrating an area ratio equation. The area ratios are obtained from the boattail and nozzle geometry. Due to the involved computations, the merits of the method were not investigated. The method has been modified by Brazier and Ball.¹⁰

The Presz-Pitkin method¹¹ predicts the flow separation point and pressure distribution on a boattail with a given solid surface sting in subsonic flow. After a determination of the separation point, an interactive method is used to match a calculated inviscid flow field, an attached boundary-layer, a control volume separation point, and the separated flow field model. This complex method is not included in this assessment.

THEORETICAL

The literature is a means for obtaining the theoretical relationships for correlative formulations. No significant, applicable theoretical

method with respect to subsonic and transonic flow was discovered which could be useful for the specific purpose of this investigation.

For supersonic flow, theory is of greater applicability because it is easier to treat mathematically. Consequently, a number of mathematical treatments of afterbody drag in supersonic flow are available. Although the supersonic case was not given extensive consideration, the work of Chapman,¹² with respect to base pressure, is fundamental. A correlation by Love¹³ is based on the Chapman method for a variety of configurations and local Mach numbers. The base pressure is also useful in determining the boattail drag coefficient in the supersonic case. There is much material available to allow a systematic treatment of the supersonic case with respect to boattail and base drag (Brazzel and Henderson¹⁴).

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SYMBOL CODE AND DEFINITIONS FOR TABLE 1

Forebody Geometry

N_1	Ogive nose	B_2	Odd-shaped fuselage
N_2	Blunt nose	B_3	Body of revolution
N_3	Conical nose	W	Wing
N_4	Elliptical nose	I	Inlet
B_1	Cylindrical body		

Afterbody Geometry (Contour)

A_1	Conical	A_5	Other body of revolution
A_2	Circular arc	A_6	Ogival
A_3	Elliptical	A_7	Other
A_4	Cylindrical	A_8	Flared

$\frac{\ell}{d_m}$ Fineness ratio

β Maximum boattail angle

$\frac{P_{t_j}}{P_\infty}$ Jet pressure ratio

$\frac{d_j}{d_m}$ Jet diameter ratio

Jet Nozzle Geometry

N_1	Conical	N_5	Plug
N_2	Contoured	N_6	Blast tube
N_3	Converging	N_7	Cylindrical
N_4	Converging-diverging	N_8	Some

$\frac{\text{Fin Thickness}}{\text{Mean Length of Chord}} = \text{Fin thickness ratio}$

Trailing Edge Position

Flush Flush with base

Aft Aft of base

Forward Forward of base

$\frac{d_b}{d_m}$ Base diameter ratio

$\frac{d_b^2 - d_j^2}{d_m^2}$ Base area ratio

Boundary Layer Character (Afterbody)

L Laminar

T Turbulent

T_r Transitional

L/T Laminar/turbulent

R_d Reynolds number based on d_{max}

R_ℓ Reynolds number based on total body length

Mounting Technique

M_1 Sting

M_5 Nose tube

M_2 Strut

M_6 Wing support

M_3 Free flight

M_7 Splitter plate

M_4 Magnetic suspension

Boattail Pressure Distribution

SPT Static pressure taps

Output Format

TE Theoretical equations
EC Empirical correlations
G Graphs
T Tables
C Combination of above

Results, Limits

TC Test conditions

TABLE 1 - SUMMARY SHEETS OF EXPERIMENTAL
INVESTIGATION REPORTS SURVEYED

			REPORTS SURVEYED				
			1	2	3	4	5
TEST CONDITIONS	MACH NUMBER RANGE		2.01, 3.27	.6 - 30	4.02	0.5 - 0.85	1.98
	REYNOLDS NO/FT x 10 ⁸		1.83-3.96	-	0.03	1.9 - 3.43	5.0
	α RANGE		0°	0 - 45°	0°	0°	0
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₃ B ₁	N ₁ B ₁	B ₁	N ₄ B ₃	N ₃ B ₁
		CONTOUR	A ₁	A ₄	A ₄	A ₂	A ₄ , A ₃
		FINENESS RATIO	1.0, 2.0	3.0	-	-	0.25 - 2.0
		MAXIMUM DIAMETER	5 cm	3.75 in	.167 in	-	-
		MAX. BOATTAIL ANGLE	10°	-	0°	-	-25°
	J E T	NUMBER	1	0.1	NONE	NONE	NONE
		TEMPERATURE	-	-	-	-	-
		PRESSURE RATIO	0-15, 40	-	-	-	-
		DIAMETER RATIO	.60	-	-	-	-
		NOZZLE GEOMETRY	N ₂ N ₃	-	-	-	N ₇ , N ₅
	F I N S	NUMBER	NONE	0, 4	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	B A S E	DIAMETER RATIO	.647	-	1.0	0.32	1.0
		AREA RATIO	.64	-		0.1	-
BOUNDARY LAYER PARAMETERS		CHARACTER	T	-	L	T	T
		R _d x 10 ⁸	.3 - .65	-	-	-	-
		R _L x 10 ⁸	2.7-5.85	-	-	5 - 900	-
TYPE OF INVESTIGATION		THEORETICAL	NO	NO	YES	NO	YES
		EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS		MOUNTING TECHNIQUE	M ₁ M ₂	M ₁	CANTILEVER	M ₁	M ₂
		BOATTAIL PRESS. DISTR.	SPT	-	-	-	SPT
		FORCE	-	-	-	YES	-
RESULTS	L I M I T S	OUTPUT FORMAT	G, T	C	T, G,	G	TE, G, EC
		M	2.01-3.27	T C	4.02	0.3	1.98
		R _d	T C	T C	T C	T C	-
		α	0°	0° - 45°	0°	0°	0
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION		AIRCRAFT	✓	✓			✓
		MISSILES		✓	✓	✓	✓
		PROJECTILES		✓	✓	✓	✓
		NACELLES	✓	✓			✓

		REPORTS SURVEYED					
		6	7	8	9	10	
TEST CONDITIONS	MACH NUMBER RANGE	0 - 6.0	2	1.58 - 2.99	1.2 - 3.0	1.62 - 2.41	
	REYNOLDS NO/FT x 10 ⁸	-	5	3	1.9 - 4.41	1.5 - 15	
	α RANGE	0 - 12°	0°	0	0	0°	
CONFIGURATION	AFTERBODY	FOREBODY	-	B ₁	N ₁ B ₁	B ₁	N ₁ B ₃
		CONTOUR	A ₁ A ₅	A ₁	A ₄	A ₁ , A ₄	A ₅
		FINENESS RATIO	0.2 - 2.0	0.5, 1	2	0.82 - 1.24	8
		MAXIMUM DIAMETER	-	2 in	1.0"	-	1.0 in
		MAX. BOATTAIL ANGLE	16°	0,3°,6°,9°	0°	+15° to -15°	-
	JET	NUMBER	1	1	1	1	NONE
		TEMPERATURE	-	COLD (70°F)	COLD (70°F)	-	-
		PRESSURE RATIO	0 - 3.2	LOW	LOW	0 - 2.3	-
		DIAMETER RATIO	0.4 - 1.0	0.4	0.4	0.2 - 0.8	-
		NOZZLE GEOMETRY	N ₄ , N ₈ , N ₃	N ₄	N ₇ ⁺ POROUS	-	-
	FINS	NUMBER	4	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	0°	-	-	-	-
		TRAILING EDGE POS.	ALL	-	-	-	-
	BASE	DIAMETER RATIO	0 - 1.0	1.0 - 0.685	1.0	-	0.336 - 1.0
		AREA RATIO	0.16 - 1.0	0.84 - 0.309	0.84	-	0.1 - 1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	-	T	T	T	T	
	R _d x 10 ⁸	-	0.83	0.25	-	0.125 - 1.25	
	R _L x 10 ⁸	-	3.4 - 4.2	1.75	-	1.0 - 10.0	
TYPE OF INVESTIGATION	THEORETICAL	YES	NO	NO	YES	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	-	M ₅	M ₂	-	M ₁	
	BOATTAIL PRESS. DISTR.	-	S P T	-	SPT	S P T	
	FORCE	-	YES	YES	-	YES	
RESULTS	LIMITS	OUTPUT FORMAT	G	G, EC	G, EC	-	G
		M	T C	T C	T C	≥ 1.0	T C
		R _d	T C	0.83 x 10 ⁶	0.25 x 10 ⁶	-	T C
		α	0 - 12°	0°	0°	-	0
		OTHER	-	2.5% BLEED	3.5% BLEED	-	-
PRINCIPAL APPLICATION	AIRCRAFT	✓	-	-	-	✓	
	MISSILES	✓	-	✓	✓	✓	
	PROJECTILES	✓	✓	✓	-	-	
	NACELLES	✓	-	-	-	✓	

		REPORTS SURVEYED					
		11	12	13	14	15	
TEST CONDITIONS	MACH NUMBER RANGE	4.3	0.5 - 15	0.9 - 1.2	0.6 - 0.9	0.6 - 0.975	
	REYNOLDS NO/FT x 10 ⁶	0.90 - 2.56	-	-	1.35 - 4.12	-	
	α RANGE	≈0°	0°	0	13°	2.4° - 9.4°	
CONFIGURATION	AFTERBODY	FOREBODY	N ₃	N ₃ (BLUNT)	N ₁ B ₃	B ₂ W I	B ₂ W
		CONTOUR	FLAT	-	A ₄	A ₆	A ₅
		FINESS RATIO	0.245	-	-	-	0.950
		MAXIMUM DIAMETER	0.737 in	-	2.5 in	-	25 in
		MAX. BOATTAIL ANGLE	-7°	-	0°	24°	-
	JET	NUMBER	NONE	NONE	1	2	1
		TEMPERATURE	-	-	COLD	HOT	-
		PRESSURE RATIO	-	-	.8	1.0	3.2 - 3.9
		DIAMETER RATIO	-	-	N ₁	0.50	0.535
		NOZZLE GEOMETRY	-	-	NONE	N ₃	N ₇
	FINS	NUMBER	NONE	NONE	-	1	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	FLUSH	-
	BASE	DIAMETER RATIO	1.0	1.0	1.0	0.50	0.535
		AREA RATIO	1.0	1.0	.335	≈0	0
BOUNDARY LAYER PARAMETERS	CHARACTER	T _r , L	T	T	T, SEPARATED	-	
	R _d x 10 ⁻⁶	0.055 - 0.157	-	-	-	-	
	R _L x 10 ⁻⁶	0.223 - 0.639	20 - 170	-	-	16-70	
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	NO	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₄	M ₃	M ₂	M ₃	M ₃	
	BOATTAIL PRESS. DISTR.	WAKE SURVEY PITOT + HOT WIRE	STRAIN GAGE TRANSDUCER	S P T	S P T	S P T	
	FORCE	NO	NO	NO	NO	NO	
RESULTS	LIMITS	OUTPUT FORMAT	G	G	G	G	G
		M	T C	0.5 - 15	T C	T C	T C
		R _d	T C	T C	T C	T C	T C
		α	≈0°	0°	-2 - +2	T C	T C
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT						
	MISSILES	✓	✓	✓	✓	✓	
	PROJECTILES	✓	✓				
	NACELLES				✓	✓	

		REPORTS SURVEYED				
		16	17	18	19	20
TEST CONDITIONS	MACH NUMBER RANGE	0.6, 0.9	0.6 - 0.9	1.25 - 4.0	0.3 - 1.3	0.6 - 1.2
	REYNOLDS NO/FT x 10 ⁶	7.01 - 21.64	-	-	1.3 - 3.6	3.1 - 4.1
	α RANGE	4.6° - 9.1°	0 - 15°	0°	0°	0°
CONFIGURATION	AFTER BODY	FOREBODY	B ₃	B ₂ W I	N ₁ N ₃ B ₁	N ₃ B ₁
		CONTOUR	A ₁ A ₂	A ₆	A ₂	N ₁
		FINENESS RATIO	1.3	-	-	1.0 - 1.5
		MAXIMUM DIAMETER	63.5 cm	-	-	15.24 cm
		MAX. BOATTAIL ANGLE	24°	24°	12.4°	10°
	JET	NUMBER	2	2	NONE	NONE
		TEMPERATURE	-	HOT	-	-
		PRESSURE RATIO	2.7 - 4.2	1.0	-	-
		DIAMETER RATIO	0.494	0.50	-	-
		NOZZLE GEOMETRY	N ₇	N ₃	-	-
	FINS	NUMBER	NONE	1	NONE	NONE
		THICKNESS RATIO	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-
		TRAILING EDGE POS.	-	FLUSH	-	-
	BASE	DIAMETER RATIO	0.494	0.50	0 - 1.0	0 - 1.0
		AREA RATIO	0.24	0	0 - 1.0	0 - 1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	T	T	L/T	T	T
	R _d x 10 ⁶	14.6 - 45.08	-	0.22 - 4	0.9 - 1.8	-
	R ₁ x 10 ⁶	91.1 - 281.1	3.5 - 65.0	0.2 - 20.0	8 - 16	-
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	NO	NO
	EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M ₂ M ₃	M ₁	M ₃	M ₂	M ₂
	BOATTAIL PRESS. DISTR.	-	S P T	NO	S P T	S P T
	FORCE	-	NO	NO	YES	NO
RESULTS	LIMITS	OUTPUT FORMAT	G	G	G	G
		M	1.0	T C	T C	T C
		R _d	T C	T C	T C	T C
		α	4.6° - 9.1°	T C	0°	0°
		OTHER	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	✓	✓		✓	✓
	MISSILES		✓	✓	✓	✓
	PROJECTILES			✓	✓	
	NACELLES	✓	✓		✓	✓

		REPORTS SURVEYED					
		21	22	23	24	25	
TEST CONDITIONS	MACH NUMBER RANGE	0.6 - 0.95, 1.2	0.3 - 1.3	1.83, 2.2	0.9 - 3.1	1.5 - 2.87	
	REYNOLDS NO/FT x 10 ⁴	3.0 - 4.3	0.08 - 0.16	3.7 - 4.5	-	2.00	
	α RANGE	0°	0°	0°	0°	0°	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ B ₁	N ₃	N ₃ B ₃	-	N ₁ B ₁
		CONTOUR	A ₆	A ₁ A ₂	A ₁ A ₂	A ₁ A ₅	A ₁
		FINENESS RATIO	1.0, 1.5	0.2 - 1.0	0.6 - 1.0	-	1.366
		MAXIMUM DIAMETER	6 in	15.24 cm	6 in	-	2.5 in
		MAX. BOATTAIL ANGLE	10°, 20°	20°	10.0°	17.2°	5.87°
	J E T	NUMBER	1	1	1	1	1
		TEMPERATURE	80° - 1350°F	270° - 300°K	270° - 300°K	70° - 2500°F	COLD
		PRESSURE RATIO	1.0 - 11	1 - 13	2.94 - 32.6	1 - 35	8 - 100
		DIAMETER RATIO	0.5	0.3 - 1.0	-	0.4 - 0.9	0.45 - 0.80
		NOZZLE GEOMETRY	N ₃ N ₄	N ₄	N ₁	N ₃ N ₄	N ₈ N ₁ N ₇
	F I N S	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	B A S E	DIAMETER RATIO	0.51	0.3 - 1.0	0.482 - 1.0	-	0.86
		AREA RATIO	0.0099	0.23 - 1.0	0.01	-	0.739
BOUNDARY LAYER PARAMETERS	CHARACTER	F	T	T	T	-	
	R _d x 10 ⁴	1.5 - 2.2	1.2 - 2.7	1.55 - 2.07		0.4166	
	R _L x 10 ⁶	15 - 24	8 - 16	-	5.5 - 35	4.83	
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	NO	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₂	M ₂	M ₂	M ₂ M ₁ M ₇	M ₂	
	BOATTAIL PRESS. DISTR.	NO	S P T	S P T	S P T	S P T	
	FORCE	YES	YES	NONE	NONE	NONE	
RESULTS	L I M I T S	OUTPUT FORMAT	G, EC	G	G	G	G
		M	0.6 - 1.2	T C	T C	T C	T C
		R _d	1.5 - 2.2	T C	T C	T C	T C
		α	0°	0°	0°	0°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	.	.	.	.	.
	MISSILES	.	.	.	.	.
	PROJECTILES	.	.	.	.	.
	NACELLES	.	.	.	.	.

		REPORTS SURVEYED				
		26	27	28	29	30
TEST CONDITIONS	MACH NUMBER RANGE	0.6 - 1.28	0.6 - 1.4	0.8	0.4 - 1.25	3.0
	REYNOLDS NO/FT x 10 ⁶	3.4 - 4.8	5.1 - 6.6	3 - 25	1 - 3	-
	α RANGE	0°	0°	0°	-4° - 12°	0°
CONFIGURATION	AFTERBODY	FOREBODY	B ₁	B ₁	N ₁ B ₁	N ₃
		CONTOUR	A ₁	A ₄	A ₁	A ₄
		FINENESS RATIO	0.22 - 1.41	0	0.6 - 1.2	-
		MAXIMUM DIAMETER	2 in	1 in	1 in	5 in
		MAX BOATTAIL ANGLE	45°	0°	20°	0°
						-12°
	JET	NUMBER	1	-	NONE	NONE
		TEMPERATURE	COLD, 70°F	COLD	-	-
		PRESSURE RATIO	1 - 8	1 - 1.70	-	-
		DIAMETER RATIO	0.36 - 1.64	0.297	-	-
		NOZZLE GEOMETRY	N ₈	N ₄	-	-
	FINS	NUMBER	NONE	4	NONE	4
		THICKNESS RATIO	-	-	-	-
		SWEEPBACK ANGLE	-	45°	-	0°
		TRAILING EDGE POS.	-	FLUSH	-	FLUSH
	BASE	DIAMETER RATIO	0.35 - 0.85	1.0	0.415	1.0
		AREA RATIO	0.30 - 0.72	0.829	0.172	1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	T	-	-	-	T
	R _d x 10 ⁶	0.57 - 0.80	0.425 - 0.55	0.75 - 6.25	-	0.11
	R _L x 10 ⁶	7.4 - 10.4	-	15 - 125	-	0.517
TYPE OF INVESTIGATION	THEORETICAL	-	NO	NO	NO	NO
	EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M ₅	M ₅	M ₁	M ₁	M ₅
	BOATTAIL PRESS DISTR.	S P T	S P T	S P T	S P T	PITOT STATIC TUBE
	FORCE	YES	NO	NO	NO	NO
RESULTS	LIMITS	OUTPUT FORMAT	G	G	G,T	T
		M	0.6 - 1.28	T C	0.8	0.4 - 1.25
		R _d	T C	T C	T C	T C
		α	0°	0°	0°	-4° - 12°
		OTHER	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	-	-	-	-	-
	MISSILES	-	-	-	-	-
	PROJECTILES	-	-	-	-	-
	NACELLES	-	-	-	-	-

		REPORTS SURVEYED				
		31	32	33	34	35
TEST CONDITIONS	MACH NUMBER RANGE	2.0	0.86 - 1.46	0.6 - 1.2	0.9 - 2.5	0.6 - 1.4
	REYNOLDS NO/FT $\times 10^{-6}$	3.0	-		6.0	
	α RANGE	0°	0°	0°	-5° - +5°	0°
CONFIGURATION	A F T E R B O D Y	FOREBODY	B ₁	-	N ₃ B ₂ W I	N ₁ B ₃
		CONTOUR	A ₄	-	A ₂	A ₄
		FINENESS RATIO	-	-	-	-
		MAXIMUM DIAMETER	1 in	-	-	4 in - 24.5 in
		MAX. BOATTAIL ANGLE	0°	-	-	0°
	J E T	NUMBER	NONE	1	2	NONE
		TEMPERATURE	-	COLD - 600°C	950°F	-
		PRESSURE RATIO	-	1.68 - 2.08	1.0 - 10.0	-
		DIAMETER RATIO	-	-	-	-
		NOZZLE GEOMETRY	-	2 - D	N ₃	-
	F I N S	NUMBER	NONE	NONE	3	4
		THICKNESS RATIO	-	-	-	10*
		SWEEPBACK ANGLE	-	-	-	0°
		TRAILING EDGE POS.	-	-	FORWARD	FLUSH
	B A S E	DIAMETER RATIO	1.0	-	-	1.0
		AREA RATIO	1.0	-	-	1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	T	-	-	-	-
	R _d $\times 10^{-6}$	0.25	-	-	-	-
	R ₁ $\times 10^{-6}$	3.0	-	-	0.5 - 100	-
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	NO	NO
	EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M ₅ (M ₁)	WALLS	M ₁	M ₁ M ₂ M ₃	M ₂
	BOATTAIL PRESS. DISTR.	NO	PITOT TUBE	SURVEY RAKE	BASE PR.	S P T
	FORCE	(B.Pr.)	NO	YES	NO	-
RESULTS	L I M I T S	OUTPUT FORMAT	G, EC	G	G	G
		M	2.0	T C	T C	T C
		R _d	0.25x10 ⁶	T C	T C	T C
		α	0°	0°	0°	-5°
		OTHER	STING INT.	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	-	-	-	-	-
	MISSILES	-	-	-	-	-
	PROJECTILES	-	-	-	-	-
	NACELLES	-	-	-	-	-

		REPORTS SURVEYED					
		36	37	38	39	40	
TEST CONDITIONS	MACH NUMBER RANGE	1.0 - 2.2	0.01	LOW SUBSONIC	0.9 - 2.0	1.1 - 1.9	
	REYNOLDS NO/FT x 10 ⁶	3.8 - 5.0	0.334	1.4	4.6 - 3.8	-	
	α RANGE	0°	0°	-2° - +6°	0°	0°	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ B ₁	N ₁ B ₁	N ₁ B ₂ W	B ₁	N ₃ B ₁
		CONTOUR	A ₁ A ₆	A ₄ TRIP WIRE SLITS	A ₆ A ₇	A ₄	-
		FINENESS RATIO	-	0	2.34 - 4.0	-	-
		MAXIMUM DIAMETER	-	1.1 in	7.66 in	-	-
		MAX BOATTAIL ANGLE	0.4°	0°	26°	0°	-
	J E T	NUMBER	1	NONE	NONE	1	NONE
		TEMPERATURE	WAT	-	-	70°F	-
		PRESSURE RATIO	1 - 10	-	-	1 - 101	-
		DIAMETER RATIO	-	-	-	0.11 - 0.33	-
		NOZZLE GEOMETRY	N ₂	-	-	N ₄ N ₈	-
	F I N S	NUMBER	1	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS	N ₂ N ₃	-	-	-	-
	B A S E	DIAMETER RATIO	-	-	0	1.0	1.0
		AREA RATIO	-	-	1	0.99 - 0.89	1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	-	1	2	T	T	
	R _d x 10 ⁻⁶	-	0.334	1.1	-	-	
	R _L x 10 ⁻⁶	-	0.42	0.5	-	4.8 - 9.2	
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	YES	NO	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₂	M ₄	M ₆	M ₅	M ₁	
	BOATTAIL PRESS DISTR	PROBL	PROBL	S P T	NO	NO	
	FORCE	NO	NO	YES	YES	NO	
RESULTS	L I M I T S	OUTPUT FORMAT	G	G	G, TE	G	G
		M	T C	LOW	T C	0.9 - 2.0	1.2 - 2.5
		R _d	T C	LOW	T C	-	T C
		α	0	0	T C	0	0
		OTHER	-	-	-	BASE PR.	-
PRINCIPAL APPLICATION	AIRCRAFT	*		*		*	
	MISSILES	*	*	*	*	*	
	PROJECTILES	*	*		*	*	
	NACELLES	*		*			

		REPORTS SURVEYED				
		41	42	43	44	45
TEST CONDITIONS	MACH NUMBER RANGE	1.57 - 3.2	0.8 - 2.5	0.55 - 2.2	0.5 - 8.0	0.9 - 3.3
	REYNOLDS NO/FT $\times 10^6$	-	40 - 1000	2.0 - 5.7	0.01 - 14	1.2 - 18.3
	α RANGE	-1° - +10°	-6° - +5°	-1° - +10°	0 - 10°	0°
CONFIGURATION	AFTERBODY	FOREBODY	$N_3 B_1$	$N_1 B_1 N_3 B_1$	$B_2 W$	$N_1 N_3 B_1$
		CONTOUR	Λ_4	Λ_4	$\Lambda_4 \Lambda_5$	Λ_4
		FINENESS RATIO	0	0	5.1	-
		MAXIMUM DIAMETER	3.00 cm	4 in	3.45 in	-
		MAX. BOATTAIL ANGLE	0°	0°	-	0°
	JET	NUMBER	NONE	NONE	2	NONE
		TEMPERATURE	-	-	-	HOT
		PRESSURE RATIO	-	-	1 - 11	-
		DIAMETER RATIO	-	-	-	0.520
		NOZZLE GEOMETRY	-	-	$N_3 N_4$	-
	FINS	NUMBER	0, 4	4	-	4
		THICKNESS RATIO	0.10	0.1	-	0.05 - 0.10
		SWEEPBACK ANGLE	0°, 30°, 60°	0°	-	0°
		TRAILING EDGE POS.	ALL	FLASH	-	ALL
	BASE	DIAMETER RATIO	1.0	1.0	-	1.0
		AREA RATIO	1.0	1.0	-	1.0
BOUNDARY LAYER PARAMETERS	CHARACTER		T	-	-	L.T
	$R_d \times 10^{-6}$			3.05	-	-
	$R_L \times 10^{-6}$			2 - 4	-	14 - 210
TYPE OF INVESTIGATION	THEORETICAL		YES	NO	NO	NO
	EXPERIMENTAL		YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE		M_1	$M_1 M_2$	$M_1 M_2$	M_1
	BOATTAIL PRESS. DISTR.		AUT. T	0.001		PRESSURE TRANSDUCER
	FORCE		NO	NO		BA + PR.
RESULTS	LIMITS	OUTPUT FORMAT	G	T	T	T
		M	T.C	T.C	T.C	T.C
		R_d	T.C	T.C	T.C	T.C
		α		T.C	-1° - 10°	0° - 10°
		OTHER	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT				*	*
	MISSILES		*	*		*
	PROJECTILES					
	NACELLES				*	*

		REPORTS SURVEYED				
		46	47	48	49	50
TEST CONDITIONS	MACH NUMBER RANGE	1.7	0.8 - 1.4	0.4 - 1.19	0.2 - 1.1	0.8 - 1.3
	REYNOLDS NO/FT $\times 10^6$	1.2	5.3 - 8.5	3	-	2.69
	α RANGE	0°	0°	0°	0°	0°
CONFIGURATION	A F T E R B O D Y	FOREBODY	$N_1 B_1$	$N_1 B_3$	$N_1 B_3 W$	B_1
		CONTOUR	$A_1 A_6$	A_5	A_7	A_4
		FINENESS RATIO	0 - 4.5	1.6 - 9.8	-	0
		MAXIMUM DIAMETER	0.75 in	7.5 in	-	0.75 in
		MAX. BOATTAIL ANGLE	12°	-	-	0°
	J E T	NUMBER	NONE	1	4	NONE
		TEMPERATURE	-	HOT	1800°F	-
		PRESSURE RATIO	-	-	HIGH	-
		DIAMETER RATIO	-	0.437	-	-
		NOZZLE GEOMETRY	-	$N_4 N_6$	N_4	-
	F I N S	NUMBER	NONE	3	3	NONE
		THICKNESS RATIO	-	0.0278	-	-
		SWEEPBACK ANGLE	-	45°	-	-
		TRAILING EDGE POS.	-	FORWARD	FLUSH	-
	B A S E	DIAMETER RATIO	0.708	0.437	-	1.0
		AREA RATIO	0.501	0	-	1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	-	T	-	T	T
	$R_d \times 10^6$	0.77	3.31 - 5.31	-	-	0.34
	$R_L \times 10^6$	5.36	20 - 130	33.7 - 67.1	-	1.1
TYPE OF INVESTIGATION	THEORETICAL	YES	NO	NO	YES	NO
	EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M_3	M_1	M_5	$M_5 M_2$	$M_1 M_5$
	BOATTAIL PRESS. DISTR.	THEORY	S P T	S P T	S P T	S P T
	FORCE	NO	NO	NO	NO	YES
RESULTS	L I M I T S	OUTPUT FORMAT	G, TE, EC	G	G	G, TE
		M	T C	T C	T C	T C
		R_d	T C	T C	T C	T C
		α	0	0	T C	0
		OTHER	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT					
	MISSILES					
	PROJECTILES					
	NACELLES					

		REPORTS SURVEYED					
		51	52	53	54	55	
TEST CONDITIONS	MACH NUMBER RANGE	1.50 - 5.0	0.6 - 1.4	1.92	1.0 - 6.9	1.62 - 2.41	
	REYNOLDS NO/FT x 10 ⁶	2.13 - 9.7	4.8	33	3 - 15	1.2 - 12	
	α RANGE	0°	0°	5°	0° - 9°	0°	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₃ B ₁	N ₁ B ₁	N ₁ B ₃	N ₁ B ₁	N ₁ N ₂ N ₃
		CONTOUR	A ₁ A ₂	A ₄	A ₆	A ₁ A ₄	A ₁ A ₄
		FINENESS RATIO	0 - 1.0	-	-	2.0 - 5.0	0
		MAXIMUM DIAMETER	5 cm	2.5 in	0.9 in	-	0.9 in
		MAX. BOATTAIL ANGLE	15°	-	-	15°	40°
	J E T	NUMBER	NONE	NONE	1	NONE	NONE
		TEMPERATURE	-	-	COLD	-	-
		PRESSURE RATIO	-	-	1 - 3.6	-	-
		DIAMETER RATIO	-	-	0.677	-	-
		NOZZLE GEOMETRY	-	-	N ₄	-	-
	F I N S	NUMBER	NONE	NONE	NONE	0 and 4	4
		THICKNESS RATIO	-	-	-	0.1	0.08
		SWEEPBACK ANGLE	-	-	-	0°	45°
		TRAILING EDGE POS.	-	-	-	FLUSH	FORWARD
	B A S E	DIAMETER RATIO	0.18 - 1.0	0.575, 1.0	0.677	0 - 1.0	0 - 1.0
		AREA RATIO	0.242 - 1.0	0.33, 1.0	0.459	0 - 1.0	0 - 1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	L/T	L/T	-	T	L/T	
	R _d x 10 ⁶	0.70 - 1.6	0.46	2.5	-	0.09 - 0.4	
	R _L x 10 ⁶	3.5 - 16	8.0	21	3 - 12	1 - 10	
TYPE OF INVESTIGATION	THEORETICAL	YES	NO	YES	YES	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁	M ₁	M ₁	M ₁	FINS	
	BOATTAIL PRESS. DISTR.	?	S P T	S P T	YES	S P T	
	FORCE	NO	YES	YES	NO	NO	
RESULTS	L I M I T S	OUTPUT FORMAT	G, TE	G	G, TE	G, EC	G
		M	T C	0.6 - 1.4	T C	T C	T C
		R _d	T C	T C	T C	T C	T C
		α	0°	0°	T C	T C	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT						
	MISSILES						
	PROJECTILES						
	NACELLES						

		REPORTS SURVEYED				
		56	57	58	59	60
TEST CONDITIONS	MACH NUMBER RANGE	0 - 2	0.9	0.14 - 0.30	3.88	0.8
	REYNOLDS NO/FT x 10 ⁶	0.57 - 3.12	-	-	1.56	4.1
	α RANGE	0	0	-	0	0
CONFIGURATION	AFTERBODY	FOREBODY	N ₂	N ₁	B ₁	B ₁
		CONTOUR	-	A ₁ A ₂ A ₆	A ₂ BASE MOUNTED CYLINDERS	A ₆
		FINENESS RATIO	-	VAR.	-	0.30 - 0.35
		MAXIMUM DIAMETER	-	-	2.45 in 76.2 mm	5 in
		MAX. BOATTAIL ANGLE	-	24°	-	0°
	JET	NUMBER	NONE	1	NONE	NONE
		TEMPERATURE	-	COLD - 1200° F	-	-
		PRESSURE RATIO	-	1 - 6.5	-	-
		DIAMETER RATIO	-	-	-	0.32 - 0.49
		NOZZLE GEOMETRY	-	-	-	N ₃
	FINS	NUMBER	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-
	BASE	DIAMETER RATIO	1.558	0.25 - 0.85	0.816	-
		AREA RATIO	2.43	-	0.667	-
BOUNDARY LAYER PARAMETERS	CHARACTER	T	T	-	T	-
	R _d x 10 ⁻⁶	0.06 - 0.32	-	-	0.389	1.7
	R _L x 10 ⁻⁶	0.27 - 1.48	-	1.0	-	-
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	NO	NO
	EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁	M ₁	M ₁	M ₅	M ₁
	BOATTAIL PRESS. DISTR.	NO	NO	S P T	S P T	S P T
	FORCE	NO	YES	NO	NO	YES
RESULTS	LIMITS	OUTPUT FORMAT	G, T	G, EC	G	G
		M	0 - 2	0.6 - 0.9	0 - 1.0	T C
		R _d	T C	ANY	T C	T C
		α	0	0	-	0
		OTHER	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	-	-	✓	-	✓
	MISSILES	-	-	-	✓	-
	PROJECTILES	-	-	-	✓	-
	NACELLES	-	-	-	-	✓

		REPORTS SURVEYED					
		61	62	63	64	65	
TEST CONDITIONS	MACH NUMBER RANGE	-	1	0 - 5	SUBS/SUPS.	1.5 - 3.25	
	REYNOLDS NO/FT x 10 ⁶	-	-	-	-	-	
	Q RANGE	0	0	0	-	0	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ N ₃ B ₁	-	B ₁	-	N ₂ B ₁
		CONTOUR	A ₁ A ₆	-	?	-	A ₄
		FINENESS RATIO	-	-	-	-	0
		MAXIMUM DIAMETER	-	-	-	-	-
		MAX. BOATTAIL ANGLE	-	3.2°	9.5°	-	0°
	J E T	NUMBER	NONE	1	1	-	NONE
		TEMPERATURE	-	-	-	-	-
		PRESSURE RATIO	-	1 - 140	1 - 144	-	-
		DIAMETER RATIO	-	0 - 1.0	-	-	-
		NOZZLE GEOMETRY	-	-	-	-	-
	F I N S	NUMBER	NONE	NONE	NONE	-	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	B A S E	DIAMETER RATIO	-	0 - 1.0	-	-	1.0
		AREA RATIO	-	-	-	-	-
BOUNDARY LAYER PARAMETERS	CHARACTER	-	T	-	L/T	T	
	R _d x 10 ⁶	-	-	-	-	1.5	
	R _L x 10 ⁶	-	-	-	-	-	
TYPE OF INVESTIGATION	THEORETICAL	YES	YES	YES	YES	YES	
	EXPERIMENTAL	NO	YES	NO	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	-	-	-	M ₁ M ₂ M ₃	M ₁	
	BOATTAIL PRESS. DISTR.	-	-	-	YES	TOTAL PRES.	
	FORCE	-	-	-	YES	NO	
RESULTS	L I M I T S	OUTPUT FORMAT	G, TE	G	EC, G	C	G, TE
		M	1.0	1	T C	T C	T C
		R _d	-	-	T C	T C	T C
		Q	0°	0°	0°	0° - 8°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	.	.	.	.	.
	MISSILES	.	.	.	.	.
	PROJECTILES	.	.	.	.	.
	NACELLES	.	.	.	.	.

		REPORTS SURVEYED					
		66	67	68	69	70	
TEST CONDITIONS							
	MACH NUMBER RANGE	1.5 - 3.0	0.4 - 1.47	0.8 - 1.3	0.98 - 1.4	0.5 - 4.0	
	REYNOLDS NO/FT x 10 ⁶	-	2.3 - 4.4	2.69 - 4.6	-	1.15 - 4.0	
	Q RANGE	0°	0°	0° - 4°	0°	-6° - 12°	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ B ₁	B ₁	N ₁ B ₁	-	N ₁ B ₁
		CONTOUR	A ₁	A ₁	A ₁ A ₂ A ₄	A ₁	A ₁ A ₂
		FINENESS RATIO	0	1, 2, 3, 4	1 - 1.25	-	1
		MAXIMUM DIAMETER	0	1.46 in	4.77 in	-	0.25 - 4.25
		MAX BOATTAIL ANGLE	0	0° - 20°	24°	-	0°
	J E T	NUMBER	NONE	NONE	1	NONE	NONE
		TEMPERATURE	-	-	1200°F	-	-
		PRESSURE RATIO	-	-	0 - 4	-	-
		DIAMETER RATIO	-	-	0.720	-	-
		NOZZLE GEOMETRY	-	-	N ₃ N ₅	-	-
	F I N S	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	B A S E	DIAMETER RATIO	-	1.0 - 1.0	0.25 - 1.0	-	-
AREA RATIO		-	1.0 - 1.0	0 - 1.0	-	-	
BOUNDARY LAYER PARAMETERS	CHARACTER	-	T ₁	T	-	T	
	R _d x 10 ⁶	-	0.28 - 0.53	0.74 - 1.0	-	0.2 - 21.3	
	R _L x 10 ⁶	1.0 - 2.6	2.5 - 6.4	-	-	36 - 149.3	
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	NO	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁	M ₁	M ₂ M ₁	-	M ₁ M ₃	
	BOATTAIL PRESS DISTR.	S P T	NO	S P T	S P T	NO	
	FORCE	NO	YES	YES	NO	NO	
RESULTS	L I M I T S	OUTPUT FORMAT	0	0	0	G	G
		M	T C	T C	T C	T C	0.5 - 4.0
		R _d	T C	0.28 - 0.53 x 10 ⁶	T C	T C	T C
		Q	0	0	T C	0	-6° - 12°
		OTHER	-	-	CLEAN AFTER-BODIES	-	-
PRINCIPAL APPLICATION	AIRCRAFT	-	-	-	-	-	
	MISSILES	-	-	-	-	-	
	PROJECTILES	-	-	-	-	-	
	NACELLES	-	-	-	-	-	

		REPORTS SURVEYED					
		71	72	73	74	75	
TEST CONDITIONS							
	MACH NUMBER RANGE	0 - 4	0.2 - 0.8	0.6 - 2.7	0.7 - 1.3	0.25 - 0.7	
	REYNOLDS NO/FT x 10 ⁶	2.65 - 5.01	1.5 - 5.4	0.6 - 10	-	3.3 - 15	
	α RANGE	-12° - 18°	-10° - 20°	0° - 10°	0°	0°	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁	N ₂	B ₁	N ₁ B ₂	N ₂ N ₃ B ₁
		CONTOUR	A ₁ A ₄ A ₇	A ₂	A ₁ A ₂	A ₇	A ₁ A ₂ A ₃
		FINENESS RATIO	1.0	2.06	1	2.4 - 2.6	
		MAXIMUM DIAMETER	2.25, 4.25	7 in	-	7" x 4.6"	2 in
		MAX. BOATTAIL ANGLE	7°	16.9°	24°	10°, 15°, 20°	16°
	J E T	NUMBER	NONE	1	2	1 and 2	NONE
		TEMPERATURE	-	COLD	-	COLD	-
		PRESSURE RATIO	-	1 - 1.15	-	1.0 - 7.0	-
		DIAMETER RATIO	-	-	-	0.26 - 0.36	-
		NOZZLE GEOMETRY	-	-	N ₃ N ₅	N ₃	-
	F I N S	NUMBER	NONE	3 4	2	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	20.083°	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	B A S E	DIAMETER RATIO	0.75 - 1.0	0.3143 - 0.6029	-	-	0.5 - 1.0
		AREA RATIO	0.56 - 1.0	0.099 - 0.363	-	0.041 - 0.096	0.25 - 1.0
	BOUNDARY LAYER PARAMETERS	CHARACTER	-	-	-	T	-
		R _d x 10 ⁶	0.94	0.9 - 3.1	-	-	0.55 - 2.5
R _L x 10 ⁶		3.7 - 6.6	9 - 32	-	-	-	
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	NO	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁ M ₃	M ₁ M ₂	M ₁ M ₂	M ₂	M ₁	
	BOATTAIL PRESS. DISTR.	NO	S P T	NO	YES	S P T	
	FORCE	NO	YES	NO	YES	NO	
RESULTS	L I M I T S	OUTPUT FORMAT	G	G	G, T	G	TE, G
		M	T C	T C	T C	T C	T C
		R _d	T C	T C	T C	-	T C
		α	-10° - 15°	-10° - 20°	0° - 10°	0°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	-	-	-	-	-	
	MISSILES	-	-	-	-	-	
	PROJECTILES	-	-	-	-	-	
	NACELLES	-	-	-	-	-	

			REPORTS SURVEYED				
			76	77	78	79	80
TEST CONDITIONS	MACH NUMBER RANGE		0 - 3	0.1 - 3.5	2.0	0.5 - 0.9	2.73 - 4.98
	REYNOLDS NO/FT x 10 ⁶		0 - 3	-	3.78	2.5, 1.2 - 1.7	2.28 - 10.56
	Q RANGE		0	0	0	0	0
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ B ₃ W	-	B ₁	N ₂ B ₁ , B ₁	N ₁ B ₁ N ₂
		CONTOUR	A ₅	A ₄ A ₆	A ₁ A ₄ A ₅	A ₄	A ₅ A ₄
		FINENESS RATIO	-	-	0 - 3.1	4, 3	0
		MAXIMUM DIAMETER	5.4 - 12 in	-	3.9 in	2, 1.4	1.5 in
		MAX. BOATTAIL ANGLE	5°	10.79°	14.5°	0	-
	J E T	NUMBER	1	1	1	2, 1	NONE
		TEMPERATURE	ROCKET	HOT	1500°C	85°F	-
		PRESSURE RATIO	-	-	2.0	1 - 8	-
		DIAMETER RATIO	0.35 - 0.44	-	0.579	0.38	-
		NOZZLE GEOMETRY	N ₄	-	N ₇	N ₁ N ₇ N ₇	-
	F I N S	NUMBER	2, 3, 4	YES	NONE	2 W, 0	NONE
		THICKNESS RATIO	0.10	-	-	0.08	-
		SWEEPBACK ANGLE	45 - 60°	-	-	0	-
		TRAILING EDGE POS	FLUSH, FWD	-	-	24 FWD	-
	B A S E	DIAMETER RATIO	0.60 - 0.70	-	0.579	1.0	1.0
		AREA RATIO	0.393 - 0.228	-	0.315	0.78, 0.86	1.0
BOUNDARY LAYER PARAMETERS	CHARACTER		-	L, T	T	T	L, T
	R _d x 10 ⁶		0 - 3	-	14.7	0.2 - 0.42	0.19 - 0.89
	R _L x 10 ⁶		1 - 15	-	-	0.6 - 1.6	0.6 - 8.8
TYPE OF INVESTIGATION	THEORETICAL		NO	YES	YES	YES	NO
	EXPERIMENTAL		YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE		-	M ₁	M ₅	M ₆ M ₅	M ₁
	BOATTAIL PRESS DISTR		3 P, 2	-	3 P, 2	NO	BASIC PR.
	FORCE		NONE	-	NO	YES	NO
RESULTS	L I M I T S	OUTPUT FORMAT	1	2, 3	1, 2	1, 2	3
		M	T, C	T, C	T, C	0.5 - 0.9	T, C
		R _d	1	T, C	T, C	0.2 - 0.4	T, C
		Q	0	0	0	0	0
		OTHER	-	-	-	BASIC DRAG	-
PRINCIPAL APPLICATION	AIRCRAFT		-	-	-	-	-
	MISSILES		-	-	-	-	-
	PROJECTILES		-	-	-	-	-
	NACELLES		-	-	-	-	-

			REPORTS SURVEYED				
			81	82	83	84	85
TEST CONDITIONS	MACH NUMBER RANGE		0.4 - 1.3	0.4 - 1.3	0.6 - 0.9	0.6 - 0.9	0.6 - 0.9
	REYNOLDS NO/FT x 10 ⁶		2.4 - 4.4	3 - 4.3	4 - 99	-	-
	α RANGE		-4° - 8°	0°	0°	0°	0°
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₃	N ₃ N ₂	N ₃ B ₁	N ₃ B ₃ W	N ₃ B ₃
		CONTOUR	A ₂	A ₂	A ₂ A ₅	A ₂ A ₂ +A ₁ A ₅	A ₂ A ₂ +A ₁ A ₅
		FINENESS RATIO	1.0 - 2.0	0.8 - 1.77	0.8, 0.96 1.77	0.8 - 1.77	0.8 - 1.77
		MAXIMUM DIAMETER	15.24 cm	15.24 cm	1 in	1 in	1 in
		MAX. BOATTAIL ANGLE	22.07°	34.037°	25°	-	-
	J E T	NUMBER	1	1	1	NONE	1
		TEMPERATURE			-	-	-
		PRESSURE RATIO	1 - 6	1 - 16	SIMUL	-	SIMUL.
		DIAMETER RATIO	0.6 - 0.7	0.50	0.5, 0.544	-	0.5 - 0.55
		NOZZLE GEOMETRY	N ₂ N ₇	N ₃	-	-	-
	F I N S	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	B A S E	DIAMETER RATIO	0.61 - 0.71	0.51	0.5, 0.544	0.5 - 0.544	0.5 - 0.544
		AREA RATIO	0.36 - 0.49	0.25	0	0	0
BOUNDARY LAYER PARAMETERS	CHARACTER		T	T	T	T	T
	R _d x 10 ⁶		1.2 - 2.18	1.5 - 2.14	0.3 - 8.2	-	-
	R ₁ x 10 ⁶		9.6 - 17.5	12 - 17	2.5 - 132	2.5 - 67	2.5 - 130
TYPE OF INVESTIGATION	THEORETICAL		NO	NO	NO	NO	YES
	EXPERIMENTAL		YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE		M ₁ M ₂	M ₁ M ₂	M ₁	M ₁	M ₁
	BOATTAIL PRESS. DISTR.		S P T	S P T	S P T	S P T	S P T
	FORCE		YES	YES	YES	NO	NO
RESULTS	L I M I T S	OUTPUT FORMAT	G	G	G	G	G
		M	T C	T C	0.6 - 0.9	T C	T C
		R _d	T C	T C	0.3 - 8.2	T C	T C
		α	T C	0°	0°	0°	0°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT				✓	✓	✓
	MISSILES		✓	✓	✓	✓	✓
	PROJECTILES		✓	✓			
	NACELLES			✓	✓	✓	✓

		REPORTS SURVEYED				
		86	87	88	89	90
TEST CONDITIONS	MACH NUMBER RANGE	0.4 - 1.3	0.6 - 2.5	0.7 - 2.2	0.6 - 1.5	0.6 - 1.5
	REYNOLDS NO/FT x 10 ⁶	2.28 - 4.25	2.1, 2.5	-	1 - 4	1.0 - 3.0
	α RANGE	0°	-5° - 25°	0°	0°	0°
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ B ₂	N ₂	B ₁	N ₃ B ₁
		CONTOUR	A ₂	A ₁	A ₄	A ₂
		FINESS RATIO	0.8 - 2.0	1.3	0	2
		MAXIMUM DIAMETER	6 in	9.86 in	11.3 in	9.86 in
		MAX. BOATTAIL ANGLE	34°	10°	1.5°	-
	J E T	NUMBER	1	1	1	1
		TEMPERATURE	-	-	COLD	70° - 2140°F
		PRESSURE RATIO	1 - 6	-	3 - 20	2 - 12.7
		DIAMETER RATIO	0.5 - 0.7	-	1.0	-
		NOZZLE GEOMETRY	-	N ₄	N ₄	N ₃
	F I N S	NUMBER	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-
	B A S E	DIAMETER RATIO	0.51 - 0.71	0.7	-	-
		AREA RATIO	0.01 - 0.014	0.5	2.05 - 2.79	0.049
BOUNDARY LAYER PARAMETERS	CHARACTER	T	T	T	-	T
	R _d x 10 ⁻⁶	-	1.72 - 2.05	-	0.49 - 1.23	0.81 - 2.4
	R _L x 10 ⁻⁶	1.5 - 2.14	24.0 - 28.9	-	7.66 - 19.15	13 - 38
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	YES	NO
	EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M ₂	M ₂	M ₅	M ₂	M ₂
	BOATTAIL PRESS. DISTR.	S P T	S P T	S P T	S P T	S P T
	FORCE	NO	YES	NO	YES	YES
RESULTS	OUTPUT FORMAT	G	G	G	G, T	G
	M	T C	T C	T C	0.6 - 1.5	0.6 - 1.5
	R _d	T C	T C	T C	T C	0.8 - 2.4
	α	0°	-5° - 25°	0°	0°	0°
	OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	✓	✓	✓	✓	✓
	MISSILES	✓	✓	✓	✓	✓
	PROJECTILES		✓	✓	✓	
	NACELLES	✓	✓	✓	✓	✓

		REPORTS SURVEYED				
		91	92	93	94	95
TEST CONDITIONS	MACH NUMBER RANGE	0.7 - 0.86	0.4 - 2.5	2.09 - 4.37	0.5 - 1.2	0.9 - 1.2
	REYNOLDS NO/FT x 10 ⁶	-	2.6 - 13.5	12.9 - 17.2	2.4	2.07 - 2.22
	α RANGE	0° - 6°	0°	0°	0°	+2°
CONFIGURATION	A F T E R B O D Y	FOREBODY	B ₁	N ₁ B ₁	B ₁	N ₁ B ₁
		CONTOUR	-	A ₄	A ₁ A ₂	A ₄ A ₁ A ₈
		FINENESS RATIO	-	0	0.22	0
		MAXIMUM DIAMETER	-	75 mm	3.36 in	2.75 in
		MAX. BOATTAIL ANGLE	-	0°	15.7°	0°
	J E T	NUMBER	1	NONE	NONE	1
		TEMPERATURE	-	-	COLD	-
		PRESSURE RATIO	1.2 - 3.6	-	-	1.0 - 3.5
		DIAMETER RATIO	-	-	-	0.65
	F I N S	NOZZLE GEOMETRY	-	-	-	N ₄
		NUMBER	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-
	B A S E	DIAMETER RATIO	-	1.0	0.917	1.0
		AREA RATIO	-	0.64 - 1.0	0.84	0.577
BOUNDARY LAYER PARAMETERS	CHARACTER	-	-	T	T	-
	R _d x 10 ⁶	-	0.35 - 2.1	-	0.55	-
	R _L x 10 ⁶	-	3 - 20	-	-	-
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	YES	NO
	EXPERIMENTAL	YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M ₂ M ₃	M ₁ M ₂	-	M ₁	M ₁ M ₂
	BOATTAIL PRESS. DISTR.	NO	S P T	S P T	S P T	S P T
	FORCE	NO	NO	NO	NO	NO
RESULTS	L I M I T S	OUTPUT FORMAT	G	G	G, T	TE, G
		M	0.7 - 0.86	T C	T C	T C
		R _d	T C	T C	T C	T C
		α	0 - 6°	0°	0°	T C
		OTHER	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	-	-	-	-	-
	MISSILES	-	-	-	-	-
	PROJECTILES	-	-	-	-	-
	NACELLES	-	-	-	-	-

			REPORTS SURVEYED				
			96	97	98	99	100
TEST CONDITIONS	MACH NUMBER RANGE		2.0 - 3.5	2.5, 3.0	0.6 - 2.2	0.6 - 0.9	0.18
	REYNOLDS NO/FT $\times 10^6$		6.0	5.52 - 6.12	-	3.68 - 4.62	1.24
	α RANGE		0	0	0	0	-10° - 10°
CONFIGURATION	AFTERBODY	FOREBODY	N ₁ B ₁	N ₁ B ₁	B ₂	B ₁	N ₂ B ₁
		CONTOUR	A ₁ A ₅ A ₆	A ₄	A ₆	A ₁	A ₂
		FINENESS RATIO	0.818 - 1.2	0	-	0 - 3.0	10, 12
		MAXIMUM DIAMETER	2.5 in	2.5 in	-	2 in	6 in
		MAX. BOATTAIL ANGLE	17°	0°	5°	11°	-
	JET	NUMBER	1	1	2	1	NONE
		TEMPERATURE	COLD	COLD	-	COLD	-
		PRESSURE RATIO	1 - 20	5 - 165	-	1.0 - 7.5	-
		DIAMETER RATIO	0.2	0.2	-	0.375	-
		NOZZLE GEOMETRY	N ₄	N ₄	N ₃ N ₄	N ₃	-
	FINS	NUMBER	NONE	RING	3	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	0°	-	-	-
		TRAILING EDGE POS.	-	ALL	-	-	-
	BASE	DIAMETER RATIO	0.5 - 0.818	1.0	-	0.418 - 1.0	0 - 1.0
AREA RATIO		0.49	0.96	-	0 - 0.85	0 - 1.0	
BOUNDARY LAYER PARAMETERS	CHARACTER		-	-	-	-	T
	R _d $\times 10^6$		12.5	1.15 - 1.27	-	0.61 - 0.77	0.618
	R _L $\times 10^6$		90	6.9 - 7.65	-	?	7.42
TYPE OF INVESTIGATION	THEORETICAL		NO	NO	NO	NO	YES
	EXPERIMENTAL		YES	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE		M ₃	M ₃	M ₃	M ₆	M ₂
	BOATTAIL PRESS. DISTR.		S P T	S P T	S P T	S P T	S P T
	FORCE		NO	NO	NO	NO	NO
RESULTS	LIMITS	OUTPUT FORMAT	G	G	G	G	G, T
		M	T C	T C	T C	T C	0.18
		R _d	T C	T C	T C	T C	T C
		α	0	0	0	0	-10° - 10°
		OTHER	-	-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT						
	MISSILES						
	PROJECTILES						
	NACELLES						

		REPORTS SURVEYED					
		101	102	103	104	105	
TEST CONDITIONS	MACH NUMBER RANGE	0 - 8.0	1.96	0.56 - 1.0	0.6 - 1.3	3.92	
	REYNOLDS NO/FT x 10 ⁶	-	-	3.6 - 4.6	3.3 - 4.4	1.65 - 38.5	
	α RANGE	0°	0°	0° - 8°	0°	0°	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₃ B ₁	SQUARE CYLINDER	N ₃ B ₁	-	B ₁
		CONTOUR	A ₁ A ₆	SQUARE CYLINDER	A ₂ A ₄ A ₆	A ₁ A ₂	A ₄
		FINENESS RATIO	1	0	0.2 - .25	0 - 3.56	0
		MAXIMUM DIAMETER		1.35 in	4 in	1 in	1.4 in
		MAX. BOATTAIL ANGLE	12°	0°	15°	45°	0°
	J E T	NUMBER	1	1	1	NONE	1
		TEMPERATURE	-	COLD	-	-	COLD
		PRESSURE RATIO	-	16.0	-	-	LOW
		DIAMETER RATIO	-	0.625 - 0.708	0.405	-	?
		NOZZLE GEOMETRY	-	N ₄	-	-	POROUS
	F I N S	NUMBER	NONE	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	-	-	-	-	-
	B A S E	DIAMETER RATIO	0 - 1.0	0.847 - 1.0	0 - 0.67	0 - 0.85	1.0
		AREA RATIO	0 - 1.0	0.218 - 0.641	0 - 0.45	0 - 0.72	1.0
BOUNDARY LAYER PARAMETERS	CHARACTER	-	-	T	T	L/T	
	R _d x 10 ⁶	-	-	-	-	0.192 - 4.49	
	R _L x 10 ⁶	2 - 22	-	-	-	-	
TYPE OF INVESTIGATION	THEORETICAL	YES	NO	YES	NO	YES	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁	ON WALL	M ₂	M ₅	M ₅	
	BOATTAIL PRESS. DISTR.	NO	S P T	S P T	S P T	NO	
	FORCE	NO	NO	YES	NO	NO	
RESULTS	L I M I T S	OUTPUT FORMAT	G	G	G	G	G, TE
		M	T C	T C	T C	T C	T C
		R _d	T C	T C	T C	T C	T C
		α	0°	0°	0° - 8°	0°	0°
		OTHER		-	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	.	.	.	.	.
	MISSILES	.	.	.	.	.
	PROJECTILES	.	.	.	.	.
	NACELLES	.	.	.	.	.

		REPORTS SURVEYED					
		106	107	108	109	110	
TEST CONDITIONS	MACH NUMBER RANGE	1.5, 2.0	1.5 - 2.41	1.9 - 2.0	0.8 - 1.1	0.77 - 1.20	
	REYNOLDS NO/FT x 10 ⁶	4.8 - 51	-	-	4	8 - 10	
	α RANGE	0	0	0	0	0	
CONFIGURATION	AFTERBODY	FOREBODY	N ₁ B ₁	-	B ₁	N ₁ B ₃	-
		CONTOUR	A ₄	A ₁ A ₂ PARAB	A ₄	A ₁ A ₄	A ₁ A ₄
		FINENESS RATIO	0	-	0	0.5 - 1.0	0.5 - 1.0
		MAXIMUM DIAMETER	1.25 in	-	0.810 in	2 in	2 in
		MAX. BOATTAIL ANGLE	0°	24.5°	PLUG 10°	9°	9°
	JET	NUMBER	NONE	1	1	1	1
		TEMPERATURE	-	-	HOT	ROOM TEMP.	ROOM TEMP.
		PRESSURE RATIO	-	2 - 20	1.2 - 10	-	-
		DIAMETER RATIO	-	-	1.136 in	0.40	0.40
		NOZZLE GEOMETRY	-	N ₃ N ₄	INT.-EXT. EXP. PLUG	N ₁	N ₁
	FINS	NUMBER	4	NONE	NONE	NONE	NONE
		THICKNESS RATIO	0.05 - 0.1	-	-	-	-
		SWEEPBACK ANGLE	0	-	-	-	-
		TRAILING EDGE POS.	FLUSH	-	-	-	-
	BASE	DIAMETER RATIO	1.0	0.55 - 0.83	0.274	0.685 - 0.95	0.69 - 0.95
		AREA RATIO	1.0	-	0.0754	0.31 - 0.74	0.31 - 0.74
BOUNDARY LAYER PARAMETERS	CHARACTER	T	-	-	T	-	
	R _d x 10 ⁶	0.5 - 4.5	-	-	0.67	1.3 - 1.7	
	R _L x 10 ⁶	0.3 - 32.8	-	-	56	-	
TYPE OF INVESTIGATION	THEORETICAL	YES	NO	YES	NO	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁ M ₃	-	M ₅ -	M ₂	-	
	BOATTAIL PRESS. DISTR.	S P T	S P T	S P T	S P T	S P T	
	FORCE	NO	NO	NO	NONE	NONE	
RESULTS	LIMITS	OUTPUT FORMAT	G, TE	EC, G	G, TE	EC, G	G
		M	T C	T C	T C	T C	T C
		R _d	T C	T C	T C	T C	T C
		α	0	0	0	0	0
		OTHER	-	-	-	LOW THRUST	LOW THRUST
PRINCIPAL APPLICATION	AIRCRAFT		✓	✓			
	MISSILES	✓	✓	✓			
	PROJECTILES				✓	✓	
	NACELLES		✓	✓			

		REPORTS SURVEYED					
		111	112	113	114	115	
TEST CONDITIONS	MACH NUMBER RANGE	0.6 - 1.3	3.88	2.01 - 3.27	2.5 - 3.5	2.5 - 3.5	
	REYNOLDS NO/FT x 10 ⁶	4.14	15.6	-	6.0	6.0	
	α RANGE	0 - 16.4°	0°	-	0°	0°	
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ B ₁	B ₁	B ₁	N ₁	N ₁ B ₁
		CONTOUR	A ₁	A ₄	A ₁ A ₄	A ₁ A ₂ A ₈	A ₄
		FINENESS RATIO	2.3	-	-	-	1
		MAXIMUM DIAMETER	-	-	-	2.5 in	2.5 in
		MAX. BOATTAIL ANGLE	8°	0°	20°	15°	0°
	J E T	NUMBER	NONE	1	1	1	1
		TEMPERATURE	-	COLD (60°F)	-	COLD	-
		PRESSURE RATIO	-	LOW	-	1 - 420	-
		DIAMETER RATIO	-	0.88 - 0.17	-	0.2	0.2
		NOZZLE GEOMETRY	-	N ₃ & POROUS	N ₄	N ₄	N ₄
	F I N S	NUMBER	2 (WINGS)	NONE	NONE	NONE	NONE
		THICKNESS RATIO	-	-	-	-	-
		SWEEPBACK ANGLE	-	-	-	-	-
		TRAILING EDGE POS.	FORWARD	-	-	-	-
	B A S E	DIAMETER RATIO	0.9	1.0	-	0.5 - 0.7	1.0
		AREA RATIO	0.8	1.0	-	0.25 - 0.49	0.96
BOUNDARY LAYER PARAMETERS	CHARACTER	T	T	-	T	T	
	R _d x 10 ⁶	2.35	15.6	-	-	1.25	
	R _L x 10 ⁶	1.4	-	-	-	7.5	
TYPE OF INVESTIGATION	THEORETICAL	YES	NO	YES	NO	NO	
	EXPERIMENTAL	YES	YES	YES	YES	YES	
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁	M ₆	-	M ₂	M ₂	
	BOATTAIL PRESS. DISTR.	NO	NO	NO	S P T	NO	
	FORCE	YES	NO	NO	NO	NO	
RESULTS	L I M I T S	OUTPUT FORMAT	G	G, FC	G	G	G
		M	1.075 - 1.3	T C	2.01 - 3.27	T C	2.5 - 3.5
		R _d	T C	15.6 x 10 ⁶	T C	T C	1.25
		α	0 - 16.4°	0°	-	0°	0°
		OTHER	-	NO BLEED	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT			*			
	MISSILES	*	*	*	*	*	
	PROJECTILES	*	*	*	*	*	
	NACELLES			*	*		

		REPORTS SURVEYED			
		116	117	118	119
TEST CONDITIONS	MACH NUMBER RANGE	3.0 - 4.0	0.6 - 0.9	3.92	SUPERSONIC
	REYNOLDS NO/FT x 10 ⁶	1.2 - 12	0.2 - 1.06	38.5	-
	α RANGE	0°	0° - 16°	0°	0°
CONFIGURATION	A F T E R B O D Y	FOREBODY	N ₁ B ₁	B ₁	-
		CONTOUR	A ₁	A ₁ A ₂ A ₇	A ₄
		FINENESS RATIO	1.0	-	0
		MAXIMUM DIAMETER	1.0 in	63.5 cm	1.4 in
		MAX. BOATTAIL ANGLE	0.6°	31°	0°
	J E T	NUMBER	NONE	1	1
		TEMPERATURE	-	-	COLD
		PRESSURE RATIO	-	1.5 - 4.5	LOW
		DIAMETER RATIO	-	0.86	-
		NOZZLE GEOMETRY	-	N ₇	HOLE AND POROUS
	F I N S	NUMBER	0, 4	-	1, 2, 3
		THICKNESS RATIO	0.062	-	-
		SWEEPBACK ANGLE	0°	-	-
		TRAILING EDGE POS.	FLUSH	FORWARD	-
	B A S E	DIAMETER RATIO	0.65	0.86	-
		AREA RATIO	0.42	-	0.017 - 0.093
BOUNDARY LAYER PARAMETERS	CHARACTER	L/T	T	-	-
	R _d x 10 ⁻⁶	0.1 - 1.0	0.43 - 2.2	-	-
	R _L x 10 ⁻⁶	1 - 7	1.9 - 25.4	-	-
TYPE OF INVESTIGATION	THEORETICAL	NO	NO	NO	YES
	EXPERIMENTAL	YES	YES	YES	YES
MEASUREMENTS	MOUNTING TECHNIQUE	M ₁	M ₁ M ₃	M ₅	-
	BOATTAIL PRESS DISTR.	NO	S P T	S P T	-
	FORCE	NO	NO	NO	-
RESULTS	L I M I T S	OUTPUT FORMAT	G	G	G
		M	3.0 - 4.0	T C	T C
		R _d	T C	T C	T C
		α	0°	0° - 16°	0°
		OTHER	-	-	-
PRINCIPAL APPLICATION	AIRCRAFT	-	-	-	-
	MISSILES	-	-	-	-
	PROJECTILES	-	-	-	-
	NACELLES	-	-	-	-

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